

VICTORIA RAMEY, EDGAR LOPEZ, and GERALD HANKINS, Dept of Biology, West Virginia State University, Institute, WV 25112. In Vitro Effects of Coal and Progesterone on Glioblastoma Proliferation and Progesterone Receptor Expression

Glioma incidence in males is 1.5 times that of females, thus it is suspected that female sex hormones play a protective role against gliomas. Compounds found in water contaminated by extractive industry waste can disrupt hormone mediated signaling. Studies have been done on endocrine disrupting effects on estrogen signaling, but little has been done on their effects on progesterone signaling. Additionally, the focus has been on classical receptors, with almost no investigation of G-protein coupled receptors. Here we investigate the effects of exposure to coal dust on cell proliferation and expression of progesterin and adipoQ receptors (PAQRs) in two human glioma cell lines, A172 and U87. Treatments with coal dust and treatments with progesterone were performed. End point RT-PCR demonstrated that A172 cells express PAQR3, PAQR5, and PAQR9. This was the first demonstration of PAQR5 expression in A172 cells. U87 cells express PAQR3, PAQR5, PAQR7, PAQR8, and PAQR9. Real time RT-PCR was performed to determine relative receptor expression per treatment type. U87 cells treated with coal dust showed up-regulation of PAQR8 and PAQR9. A172 cells treated with either progesterone or coal dust showed up-regulation of PAQR9. Proliferation test on A172 showed 20% increase in proliferation in cells treated with coal dust for 24 hours and a 6% increase in cells treated for 48 hours. The U87 cell line showed a 7% increase in proliferation after 24 hours of coal dust treatment, with no statistically significant change for 48-hour treatments. Neither cell line expressed statistically significant changes after progesterone treatment. Supported by NSF EPSCoR Research Infrastructure Improvement Program award 1458952, the NASA West Virginia Space Grant Consortium, and NIH Grants 5P20RR016477 and P20GM103434 to the West Virginia IDeA Network for BioMedical Research Funding.